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In re Application of:

§ §

Serial No.: ~~09/753,495~~

Group Art Unit: 1764

Filed: January 2, 2001

Docket No: AVIS/1014C

**For: METHOD OF REMOVING
CONTAMINANTS FROM
USED OIL**

Confirmation No.: 2162

Date: February 27, 2006

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Robb D. Edmonds

Robb D. Edmonds

Dear Sir:

APPEAL BRIEF SUBMITTED UNDER 37 C.F.R. § 41.37

Applicant submits this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 1764 dated April 25, 2005, finally rejecting claims 4, 6-9, 11-13, 16-22, 25-28, 31, 32, 34-36 and 39-42.

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I. Real Party in Interest

The real party in interest is Avista Resources, Inc.

II. Related Appeals and Interferences

Applicant asserts that no other appeals or interferences are known to the Applicant, the Applicant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 4, 6-9, 11-13, 16-22, 25-28, 31, 32, 34-36 and 39-42 are pending in the application. Claims 1-3 were originally presented. Claims 1-3 were cancelled without prejudice, and new claims 4-38 were added by the Preliminary Amendment mailed on August 16, 2001. Claim 10 was cancelled without prejudice by the amendment mailed on February 26, 2002. Claims 5, 14-15, 23-24, 29-30, 33 and 37-38 were cancelled without prejudice and new claims 39-42 were added by the amendment mailed on May 9, 2003. The rejection of pending claims 4, 6-9, 11-13, 16-22, 25-28, 31, 32, 34-36 and 39-42 is appealed. Those pending claims are shown in the attached Claims Appendix.

IV. Status of Amendments

All amendments have been entered by the Examiner and are reflected in the listing of claims shown in the attached Claims Appendix.

V. Summary of Claimed Subject Matter

The claimed subject matter relates to the removal of impurities/contaminants from used oil. See, specification at page 2, ll. 11-13. In removing these contaminants, the claimed subject matter makes use of a class of catalysts known as phase transfer catalysts, which are employed in a process to facilitate the transfer of inorganic or organic bases to the substrate in the used oil. Id. at page 4, ll. 12-15. The phase transfer catalyst is added to the used oil in the presence of the base compound, and the resulting mixture is treated to remove contaminants from the oil. Id. at page 4, line 23 through page 5, line 1. A benefit of the claimed subject matter is that the only wastewater generated by the process is that which is originally present in the used oil and the small amount present in the base compound. Id. at page 5, ll. 13-18.

VI. Grounds of Rejection to be Reviewed on Appeal

The following grounds of rejection are to be reviewed on appeal.

- A. The rejection of claims 4, 6, 11 and 12 under 35 U.S.C. § 102(b) as being anticipated by Norman (U.S. 4,431,524).
- B. The rejection of claims 7-9, 13, 16-22, 25-28, 31, 32, 34-36 and 39-42 under 35 U.S.C. § 103(a) as being unpatentable over Norman (U.S. 4,431,524) in view of Chavet (WO 97/00928).
- C. The rejection of claims 25-28, 31, 32, 34-36, 41 and 42 under 35 U.S.C. § 103(a) as being unpatentable over Chavet (WO 97/00928).

VII. Argument

A. Norman Does Not Teach, Show Or Suggest The Claimed Invention

Claims 4, 6, 11 and 12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Norman (U.S. 4,431,524). The Examiner maintains that Norman discloses a process of contacting oil with an aqueous solution of a basic salt; treating the resulting mixture to separate water from the oil; mixing that separated oil with a glycol; and removing contaminants from the glycol/oil mixture.

Applicant respectfully traverses the rejection on grounds that Norman does not teach, show, or suggest the claimed invention. In particular, Norman does not teach, show, or suggest adding a phase transfer catalyst to the at least partially dehydrated used oil mixture comprising used oil and base compound to provide a used oil mixture comprising used oil, phase transfer catalyst, and base compound, and removing contaminants from at least a portion of the used oil mixture comprising used oil, phase transfer catalyst, and base compound, as recited in claim 4 as well as those dependent therefrom.

Instead, Norman discloses a process of contacting used oil with an aqueous solution of a basic salt to precipitate metal contaminants, polar compounds and/or particulates (*i.e.* "solid contaminants") and separating the solid contaminants and bulk water to provide a solids-free oil mixture. See Norman at col. 5, line 16 through col. 6, line 6. The treated oil (*i.e.* the oil with the bulk water and solid contaminants removed) is centrifuged to remove "fine particulates and any remaining suspended water from the oil." Id. at col. 6, ll. 21-25 (emphasis added). The oil is then advanced to a vacuum drier 22 to "remove dissolved water, light hydrocarbons, ... and non-condensables, such as air, from the oil." Id. at col. 6, ll. 54-58. At this point, all base compound is separated and removed from the oil. Finally, the dried and degassed oil is directed to a reactor 26 or to still 24 then to the reactor 26. Id. at col. 6, line 65 through col. 7, line 6. In the reactor 26, a polyfunctional mineral acid ("component A") and a polyhydroxy compound ("component B") are added to the treated oil and reacted "until all or substantially all of the metallic contaminants in the oil have reacted with either or both components (A) and (B)." Id. at col. 7, ll. 27-41.

Clearly, the process disclosed in Norman separates all water and precipitated solid contaminants, including all the base compound whether reacted or not reacted (*i.e.* excess base compound), from the oil prior to the addition of the glycol. In other words, any base compound or precipitate containing the base compound is removed from the oil long before the glycol/solvent addition. Accordingly, one of ordinary skill in the art reviewing this reference could not imply or believe, contrary to the Examiner's assertion, that any of the base compound is still present within the oil at this point of the process.

Therefore, at the very least, Norman does not teach, show, or suggest adding a phase transfer catalyst to the at least partially dehydrated used oil mixture comprising used oil and base compound to provide a used oil mixture comprising used oil, phase transfer catalyst, and base compound, and removing contaminants from at least a portion of the used oil mixture comprising used oil, phase transfer catalyst, and base compound, as recited in claim 4 as well as those dependent therefrom. For at least this reason, withdrawal of the rejection and allowance of claims 4, 6, 11 and 12 is respectfully requested.

Furthermore, Applicant notes that the incorporation of a phase transfer catalyst in the presence of a base compound provides unexpected advantages. A first significant advantage is that neither the phase transfer catalyst nor the base compound is soluble in oil; however, when the phase transfer catalyst and the base compound are combined, those compounds form a soluble alkoxide (*i.e.* a compound that is soluble in oil). A second significant advantage is that once the alkoxide reacts with the contaminants within the oil, the phase transfer catalyst is regenerated and returned to the aqueous phase, allowing the regenerated phase transfer catalyst to combine with more base compound. Conversely, Norman adds heat to reduce the viscosity of the oil to increase dispersity of the base compound within the oil. See Norman at col. 5, ll. 40-43. Norman also uses mixing and/or demulsifying agents as additional techniques to increase dispersity by increasing the phase boundary between the aqueous base compound and the oil. Id. at col. 5, ll. 28-30 and at col. 5, ll. 60-66. Withdrawal of the rejection and allowance of claims 4, 6, 11 and 12 is respectfully requested.

B. A Combination of Norman and Chavet Does Not Teach, Show Or Suggest The Claimed Invention

Claims 7-9, 13, 16-22, 25-28, 31, 32, 34-36 and 39-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Norman (U.S. 4,431,524) in view of Chavet (WO 97/00928 or the US equivalent, U.S. Patent No. 6,072,065). The Examiner maintains that it would have been obvious “to have modified the process of Norman by distilling to remove contaminants at any appropriate set of conditions as suggest by the WO reference because distilling will remove contaminants from a mixture similar to the mixture present in the Norman process and therefore distilling would be expected to be an effective separation method in the process of Norman.” Also, the Examiner states that it would have been obvious “to have modified the process of Norman by treating the claimed used oils because such oils are chemically and physically similar to the oils disclosed by Norman and therefore would be expected to be effectively treated in the process of Norman.”

Applicants respectfully traverse the rejection on grounds that the Examiner has not established a *prima facie* case of obviousness. To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. See In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Further, the teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, not in the applicants' disclosure. See M.P.E.P. § 2143, citing In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991). Still further, the examiner must *particularly* identify any suggestion, teaching or motivation from *within* the references to combine the references (emphasis added). See In Re Dembiczak, 50 USPQ2d 1614 (Fed. Cir. 1999). The mere recitation of a combination of references does not amount to particularly identifying a suggestion, teaching, or a motivation to combine the references. Moreover, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Here, the Examiner has merely stated that it would have been obvious “to have modified the process of Norman by distilling to remove contaminants at any appropriate set of conditions as suggest by the WO reference because distilling will remove contaminants from a mixture similar to the mixture present in the Norman process and therefore distilling would be expected to be an effective separation method in the process of Norman.” That assertion is nothing more

than an "obvious to try" standard which the Court of Appeals for the Federal Circuit has held not to be a proper test for determining obviousness under 35 U.S.C. § 103. See In re O'Farrell, 7 U.S.P.Q. 2d 1673 (Fed. Cir. 1988). Obviousness is tested by what combined teachings of prior art references would have suggested to those of ordinary skill in art, not by whether a particular combination of elements from such references might have been "obvious to try." In re Fine, USPQ2d 1596 (Fed. Cir. 1988).

Furthermore, Applicant traverses the rejection on grounds that a combination of the references does not motivate or suggest the claimed invention. As noted above, the Examiner states that it would have been obvious "to have modified the process of Norman by treating the claimed used oils because such oils are chemically and physically similar to the oils disclosed by Norman and therefore would be expected to be effectively treated in the process of Norman." However, the Examiner has provided no evidence to support such an assertion. In fact, not one mixture of Norman is similar, either physically or chemically, to any one mixture of Chavet.

Referring to Chavet (U.S. Patent No. 6,072,065), Chavet discloses a four step process that includes a first preliminary distillation step ("step A"); an alkaline treatment step ("step B"); water wash followed by settling to recover the oil phase ("step C"); and distillation of the recovered oil phase ("step D"). See Chavet at col. 3, lines 11-25. Step A is a two step distillation process to remove water and the heavy gasoline fractions in the first distillation step at atmospheric pressure and to recover a gas-oil fraction and vacuum distillate in the second distillation step under a reduced pressure. Id. at col. 3, lines 32-45 (emphasis added). Step B then adds an alkaline reactant in the presence of a solvent to the previously dehydrated and separated distillate of Step A. Id. at col. 3, lines 61-63. The separated, gas-oil fraction is recovered. Step C then utilizes a water wash to remove the solvent and alkaline from the vacuum distillate. Id. at col. 4, lines 40-47. The resulting, water washed oil phase is then distilled using a two step distillation process or step D. Id. at col. 5, lines 8-15.

As discussed above, Norman discloses a process of washing oil with an aqueous solution of a basic salt to precipitate metal contaminants, polar compounds and/or particulates ("step 1"). In "step 2," the oil is then treated to remove water, base compound and solid precipitates from the oil. The oil is then vacuum dried to "remove dissolved water, light hydrocarbons, ... and non-condensables, such as air, from the oil." Norman at col. 6, ll. 54-58. In "step 3," the vacuum dried oil is then mixed with a glycol and trace contaminants are removed from the oil.

Accordingly, not one mixture of step 1, 2, or 3 of Norman is similar, either physically or chemically, to any one mixture of step A, B, C, or D of Chavet because the presence of water, hydrocarbons and/or contaminants at the various stages of the respective processes changes the boiling point of the oil as well as the solubility of the contaminants within the oil. More significantly, the used oil of Norman is not even similar, either physically or chemically, to the used oil of Chavet. According to Norman, the term ‘used industrial oils’ is used... to mean used industrial oils ... for use in non-motor vehicle applications in industrial or power producing plants. This term does not, however, mean used crank case oil from motor vehicles such as, for example, cars, trucks and locomotives, as well as gear oils, automatic transmission fluids and other functional fluids in which the major constituent is an oil of lubricating viscosity.” Norman at col. 1, lines 24-27; col. 3, line 66 - col. 4, line 2. Conversely, the term “used oils” in Chavet “designates an oil or mixture of oils in variable proportions originating from various origins in particular from industrial applications. As this is well known, industrial or engine lubricant oils contain various additives used to provide the required specific characteristics for the contemplated applications.” Chavet at col. 1, lines 8-14.

As such, the respective raw, used oils of Chavet and Norman are not the same. Accordingly, the Examiner has not shown that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would select the various processes from the prior art and combine them in the claimed manner because the treated oil in Chavet and Norman are not the same, either chemically or physically. See In re Rouffet, 149 F.3d 1350, 1355-56 (Fed. Cir. 1998). Therefore, the Examiner has not established a *prima facie* case of obviousness, and withdrawal of the rejection and allowance of the claims is respectfully requested.

C. Chavet Does Not Teach, Show Or Suggest The Claimed Invention

Claims 25-28, 31, 32, 34-36, 41 and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chavet (WO 97/00928 or the US equivalent, U.S. Patent No. 6,072,065). The Examiner states that the WO reference discloses a process of contacting the oil with an alkaline reactant in the presence of a solvent and following the contacting, contaminants are removed from the oil by distillation. The Examiner further asserts that the water-washing step of Chavet

“only removes alkaline reactant in excess, it appears as if a mixture as claimed is distilled in the process of the WO reference.”

Applicants respectfully traverse this rejection. Chavet does not teach, show, or suggest distilling a mixture comprising used oil, base compound and phase transfer catalyst (or glycol), as required in base claims 25 and 31 and those dependent therefrom. Contrary to the Examiner's assertion, Chavet very clearly states that the water wash step removes all of the base compound. Chavet states that the water wash step (step (c)) is essential to remove (1) any alkaline reactant in excess, (2) the alcohol if used as a solvent and (3) all water soluble by-products resulting from the alkaline reacted contaminants. (See Chavet '065 at col. 4, lines 43-47.) There is no other base compound. The amount of base compound added equals the amount reacted (*i.e.* “the water soluble by-products resulting from the alkaline reacted contaminants”) and the excess. If the base compound does not react, it is excess. Both of which are removed during the water wash step. Therefore, Chavet does not teach, show, or suggest distilling a mixture comprising used oil, base compound and phase transfer catalyst (or glycol), as required in base claims 25 and 31 and those dependent therefrom.

VIII. Conclusion

In conclusion, the references of record, neither alone nor in combination, teach, show, or suggest the claimed subject matter. Therefore, Applicant submits that the pending claims are patentable over the reference, and respectfully request withdrawal of the rejections and allowance of the claims.

Respectfully submitted,

EDMONDS, P.C.

02/27/2006
Date

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IX. Claims Appendix

Claims 1-3 (Cancelled).

4. A method for purifying used oil, comprising:
 - mixing a raw used oil with a base compound to form a mixture comprising used oil and base compound;
 - processing the mixture comprising used oil and base compound to provide an at least partially dehydrated used oil mixture comprising used oil and base compound;
 - adding a phase transfer catalyst to the at least partially dehydrated used oil mixture comprising used oil and base compound to provide a used oil mixture comprising used oil, phase transfer catalyst, and base compound, wherein the phase transfer catalyst comprises a glycol; and
 - removing contaminants from at least a portion of the used oil mixture comprising used oil, phase transfer catalyst, and base compound.
5. (Cancelled).
6. The method of claim 4, wherein the phase transfer catalyst comprises ethylene glycol.
7. The method of claim 4, wherein removing contaminants from at least a portion of the used oil mixture comprising used oil, phase transfer catalyst, and base compound comprises distilling the used oil mixture at a temperature of about 200°C to about 275°C and a pressure of about 100 Torr to about 200 Torr.
8. The method of claim 4, wherein removing contaminants from at least a portion of the used oil mixture comprising used oil, phase transfer catalyst, and base compound comprises distilling the used oil mixture at a temperature of about 275°C to about 300°C and a pressure of about 0.05 Torr to about 0.2 Torr.

9. The method of claim 4, wherein removing contaminants from at least a portion of the used oil mixture comprising used oil, phase transfer catalyst, and base compound comprises distilling the used oil mixture at a temperature of about 200°C to about 300°C and a pressure of about 0.05 Torr to about 200 Torr.

10. (Cancelled).

11. The method of claim 4, wherein the base compound is an inorganic or organic base compound.

12. The method of claim 11, wherein the inorganic base compound is selected from the group consisting of sodium hydroxide, potassium hydroxide, and combinations thereof.

13. The method of claim 4, wherein the used oil mixture comprising used oil, phase transfer catalyst and inorganic base compound comprises of from about 1% to about 10% by weight of the phase transfer catalyst.

Claims 14-15. (Cancelled).

16. The method of claim 4, wherein the used oil comprises motor oil.

17. A method for removing contaminants from a used petroleum distillate, comprising:

mixing a raw used petroleum distillate with a base compound to form a mixture comprising used petroleum distillate and base compound;

processing the mixture comprising used petroleum distillate and base compound to provide an at least partially dehydrated used petroleum distillate mixture comprising used petroleum distillate and base compound;

adding ethylene glycol to the at least partially dehydrated used petroleum distillate mixture comprising used petroleum distillate and base compound to provide a used petroleum distillate mixture comprising used petroleum distillate, ethylene glycol, and base compound; and

removing the contaminants from at least a portion of the used petroleum distillate mixture comprising used petroleum distillate, ethylene glycol, and base compound using means for distillation.

18. The method of claim 17, wherein the used petroleum distillate comprises motor oil.
19. The method of claim 17, wherein removing contaminants from at least a portion of the used petroleum distillate mixture comprising used petroleum distillate, ethylene glycol, and base compound comprises distilling the used petroleum distillate mixture at a temperature of about 200°C to about 275°C and a pressure of about 100 Torr to about 200 Torr.
20. The method of claim 17, wherein removing contaminants from at least a portion of the used petroleum distillate mixture comprising used petroleum distillate, ethylene glycol, and base compound comprises distilling the used petroleum distillate mixture at a temperature of about 275°C to about 300°C and a pressure of about 0.05 Torr to about 0.2 Torr.
21. The method of claim 17, wherein removing contaminants from at least a portion of the used petroleum distillate mixture comprising used petroleum distillate, ethylene glycol, and base compound comprises distilling the used petroleum distillate mixture at a temperature of about 200°C to about 300°C and a pressure of about 0.05 Torr to about 200 Torr.
22. The method of claim 17, wherein the used petroleum distillate mixture comprising used petroleum distillate, ethylene glycol, and inorganic base compound comprises of from about 1% to about 10 % by weight of ethylene glycol.

Claims 23-24. (Cancelled).

25. A method for removing contaminants from used oil, comprising:
mixing used oil with ethylene glycol in the presence of a base compound to provide a used oil mixture comprising used oil, ethylene glycol and base compound; and

distilling the used oil mixture comprising used oil, ethylene glycol and base compound at a temperature of about 200°C to about 300°C and a pressure of about 0.05 Torr to about 200 Torr.

26. The method of claim 25, wherein the base compound comprises an inorganic compound.

27. The method of claim 26, wherein the inorganic base compound is selected from the group consisting of sodium hydroxide, potassium hydroxide, and combinations thereof.

28. The method of claim 25, wherein the used oil mixture comprising used oil, ethylene glycol and base compound comprises of from about 1% to about 10% by weight of the ethylene glycol.

Claims 29-30. (Cancelled).

31. A method for removing contaminants from used oil, comprising:

mixing used oil with an inorganic base compound to provide a used oil mixture comprising used oil and inorganic base compound;

mixing the used oil mixture comprising used oil and inorganic base compound with a phase transfer catalyst to provide a used oil mixture comprising used oil, phase transfer catalyst and inorganic base compound, wherein the phase transfer catalyst comprises a glycol; and

distilling the used oil mixture comprising used oil, phase transfer catalyst and inorganic base compound at a temperature of about 200°C to about 275°C and a pressure of about 100 Torr to about 200 Torr to remove at least a portion of the phase transfer catalyst, providing a distilled used oil mixture.

32. The method of claim 31, wherein the inorganic base compound is selected from the group consisting of sodium hydroxide, potassium hydroxide, and combinations thereof.

33. (Cancelled).

34. The method of claim 31, wherein the phase transfer catalyst comprises ethylene glycol.
35. The method of claim 31, further comprising distilling the distilled used oil mixture at a temperature of about 275°C to about 300°C and a pressure of about 0.05 Torr to about 0.2 Torr.
36. The method of claim 31, wherein the used oil mixture comprising used oil, phase transfer catalyst and inorganic base compound comprises of from about 1% to about 10% by weight of the phase transfer catalyst.

Claims 37-38. (Cancelled).

39. The method of claim 4, wherein a concentration of the base compound in the used oil mixture comprising used oil and base compound is between 0.5 weight percent and 5 weight percent on a dry weight basis.
40. The method of claim 17, wherein a concentration of the base compound in the used petroleum distillate mixture comprising used petroleum distillate and base compound is between 0.5 weight percent and 5 weight percent on a dry weight basis.
41. The method of claim 25, wherein a concentration of the base compound in the used oil mixture comprising used oil, ethylene glycol and base compound is between 0.5 weight percent and 5 weight percent on a dry weight basis.
42. The method of claim 31, wherein a concentration of the inorganic base compound in the used oil mixture comprising used oil and inorganic base compound is between 0.5 weight percent and 5 weight percent on a dry weight basis.

X. Evidence Appendix

NONE.

XI. Related Proceedings Appendix

NONE.